

Fit Facts™

FROM THE AMERICAN COUNCIL ON EXERCISE®



Feeling a Little Eccentric?

A muscle contracts eccentrically when it lengthens under tension during exercise. For example, during a biceps curl, the biceps muscle shortens during the concentric lifting phase and lengthens during the eccentric lowering phase. Eccentric contractions also can occur during aerobic activity, such as downhill running, in which the quadriceps muscle repeatedly lengthens against gravity to lower the center of mass and aid in shock absorption.

Don't Be a Sore Loser

DELAYED MUSCLE SORENESS. It's the name of the stiff pain you feel as you roll over and reach to turn off the morning alarm after a day in which you trained unusually hard or tried a new exercise. Some people feel there's no better reward; others cease to exercise. What everyone should know is that there is a way to prevent this muscle soreness.

What Causes Sore Muscles?

There are two types of exercise-related muscle soreness. Immediate muscle soreness quickly dissipates and is the pain you feel during, or immediately after, exercise. Delayed muscle soreness signals a natural adaptive process that the body initiates following intense exercise. It manifests 24 to 48 hours after the exercise session and spontaneously decreases after 72 hours.

Numerous studies have been conducted to determine the cause of delayed muscle soreness, and the theories have been many and controversial. The most current research attributes it to microscopic tears in the muscle and surrounding connective tissue following eccentric exercise (see "Feeling a Little Eccentric?"). Those who experience delayed muscle soreness include conditioned individuals who increase the intensity, frequency or duration of their workouts, or participate in an activity that they are unfamiliar with. Beginning exercisers, or those who have undergone a significant lapse in training, frequently experience soreness when starting a new exercise program.

Studies on the best methods to alleviate delayed muscle soreness are almost as abundant as the number of studies conducted to determine its cause. Cryotherapy (the topical application of ice), massage, stretching and the use of nonsteroidal anti-inflammatory drugs (NSAIDs), among other less conventional approaches, have been tested to determine if they can

prevent delayed muscle soreness or are effective treatments. To date, no therapy that hastens the decrease of delayed muscle soreness has been found, however some of the therapies previously mentioned may have a minor impact if initiated immediately after intense or unusual exercise.

The Good News

Once you induce delayed onset muscle soreness at a specific exercise intensity, you shouldn't experience that sensation again until intensity is increased.

This is because delayed muscle soreness has been shown to produce a rapid adaptation response, which means that the muscles adapt to an exercise intensity. Until it is changed, soreness won't occur. This is the basis for the most widely recommended approach to preventing delayed muscle soreness: Gradual progression and conservative increases in intensity, frequency or duration. Preliminary light exercise may prevent the onset of soreness following a heavy eccentric-exercise workout. Beginners should exercise with light weights, two to three times per week for one or two months, then gradually build. Already-conditioned exercisers who want to try a new workout or sport also should begin gradually, taking care not to be overzealous.

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